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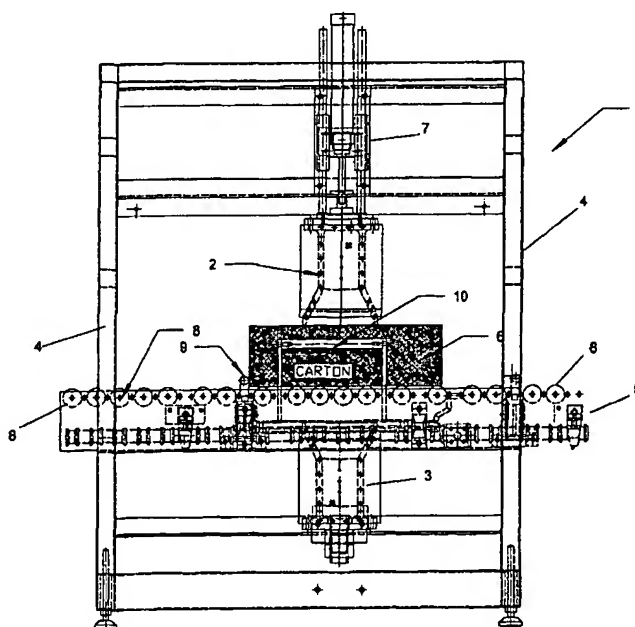
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[Continued on next page]

(54) Title: MEASUREMENT APPARATUS AND METHOD



(57) Abstract: An apparatus (1) for measuring the transmission or attenuation of electromagnetic radiation through an object (6), said apparatus including an electromagnetic radiation emitter (2) and detector (3), characterised in that to perform transmission/attenuation measurements, the apparatus is configurable such that said emitter (2) is positioned immediately adjacent the surface of said object (6) and said detector (3) is positioned on an opposing side of the object (6) such that the detector (3) solely, or at least substantially receives electromagnetic radiation transmitted through the object (6) from the emitter (2).

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ2003/000279

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. ⁷: G01N 22/04, 33/12, G01K 11/06, 13/10, A23B 4/06, 4/07

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

FWPI: /ic g01n-022 or g01n-023 or g01n-021 or g01k, freez+ or frozen or thaw+ or melt+ or molten or frost+ or defrost+ or chill+ or cool+ or cold+ or ice, microwav+ or radiofrequen+ or radiowav+ or (radio (w) wav+) or electromagnetic or radiation, measur+ or detect+ or determin+, absor+ or transmi+ or attenuat+, (antenna+ or aerial+ or transmitter? or receiver? or emitter? or detector?) (s) (touch+ or contact+ or proxim+ or abut+ or adjacent+), opposite

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 1998/001747 A1 (REED) 15 January 1998 Whole document	1-4,10-20
X	Patent Abstracts of Japan, JP 59-176655 A (HITACHI HEATING APPLIANCE CO LTD) Abstract; drawing	1-4,17-20
X	GB 1114157 A (ASSOCIATED ELECTRICAL INDUSTRIES LIMITED) 15 May 1968 Whole document	1-4,10-20

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☒ See patent family annex

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C (Continuation).

DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KUPFER, "Mikrowellenfeuchtmeßgeräte und ihr Einsatz in der Prozeßtechnik", Technische Messen, vol. 61, no. 11, November 1994, pages 409-420 Page 413-415; Figures 4-5	1-4,10-20
X	WO 1991/002966 A1 (COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION) 7 March 1991 Abstract; Figure 5	1-4,10-20
X	GB 2297846 A (MMC SPACE SYSTEMS LIMITED) 14 August 1996 Page 9, line 4-page 10, line 15; Figures 1-2; Claims	1-4,10-20
X	US 5845529 A (MOSHE et al.) 8 December 1998 Claims; Column 1, lines 54-61; Figure 7A	1-4,10-20
X	US 5871397 A (NELSON et al.) 16 February 1999 Claim 1; Figure 1	1-4,10-20
X	GB 2359630 A (THOMPSON et al.) 29 August 2001 Whole document	1-4,10-20
X	GB 2185311 A (FILTROL CORPORATION) 15 July 1987 Claims; Page 2, lines 17-44; Figure 1	1-4,10-20
X	US 4131845 A (PAKULIS) 26 December 1978 Claims; Figures 1-2	1-4,17-20
X	US 4727311 A (WALKER) 23 February 1988 Column 6, lines 18-38; Claims	1-4,10-20
X	DD 203398 A (WEBER et al.) 19 October 1983 Claims; Figure	1-4,10-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/NZ2003/000279

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member	
WO	9801747	AU	34515/97
JP	59176655	GB	2319087
GB	1114157		
WO	9102966	AU	61689/90
		CA	2063717
		EP	0487582
		US	5333493
GB	2297846		
US	5845529	AU	15909/99
		AU	49334/97
		AU	50632/99
		BR	9912701
		CA	2339922
		EP	0756170
		EP	0950177
		EP	1031028
		US	5621330
		US	6025724
		US	6107809
		WO	0009983
		WO	9829729
		WO	9927353
US	5871397	US	5934997
GB	2359630		
GB	2185311	CA	1265875
		DE	3700751
		US	4825077
US	4131845		
US	4727311	US	4962384
DD	203398		
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			
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